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Indian Standard

SPECIFICATION FOR PLASTICS FILTER FUNNELS

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SPECIFICATION FOR PLASTICS FILTER FUNNELS

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Indian Standard

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0. FOREWORD

0.1 This Indian Standard was adopted by the Indian Standards Institution on 14 July 1982, after the draft finalized by the Laboratoryware and Related Apparatus Sectional Committee had been approved by the Chemical Division Council.

0.2 This standard is based on the sizes of currently available filter papers which are 55, 70, 90, 110, 125, 150, 185 and 240 mm in diameter. This standard specifies filter funnels of plastics intended for use with aqueous solutions between 0°C and 60°C. Before using these filter funnels for strong acids, alkalis, oxidizing agents or non-aqueous liquids, or at temperatures outside the temperature range mentioned above, users should satisfy themselves either by laboratory tests or by reference to the manufacturer or supplier, that the filter funnels are suitable for such applications. Plastics filter funnels complying with this standard are marked both with a recommended maximum temperature of use and an indication of the material of construction.

0.3 In the formulation of this standard assistance has been derived from ISO/DIS 7057 Laboratoryware plasticware — Filter funnels, issued by the International Organization for Standardization (ISO).

0.4 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960*. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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1. SCOPE

1.1 This standard prescribes requirements and methods of sampling and test for plastics filter funnels for general laboratory purposes.

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*Rules for rounding off numerical values (*revised*).

2. SIZES

2.1 The preferred sizes of filter funnels covered by this standard are defined by their internal bowl diameters and shall be as follows:

35, 55, 75, 100, 150 and 200 mm.

The tolerance on diameter shall be ±5 percent. General designs of filter funnels are illustrated in Fig. 1.

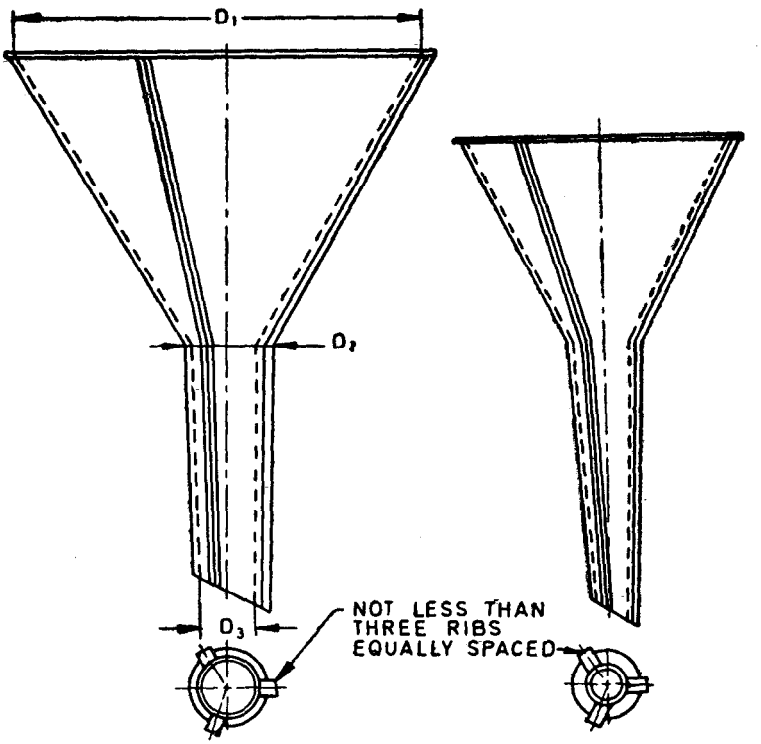

FIG. 1 GENERAL DESIGNS OF PLASTICS FILTER FUNNELS

3. REQUIREMENTS

3.1 Material — Filter funnels shall be constructed of generally non-brittle plastics material of suitable chemical and thermal properties. They shall be of single piece moulding and shall be as far as possible free from moulding defects and stress.

3.1.1 *Resistance to Extraction of Ionic Material by Water at 60°C* — When tested according to the procedure given in Appendix A, the funnel shall give an aqueous extract, free of suspended matter, and having a conductivity not more than 200 μS/m greater than that of the original water used for the extraction.

NOTE — The conductivity of water containing approximately one part per million of sodium chloride, is 200 μs/m.

3.2 Construction — The filter funnel shall consist of a bowl having the shape of a frustum of a right circular cone and a stem co-axial with the cone.

3.2.1 The internal surface of the filter funnel shall have smooth contours with a stepless transition from bowl to stem.

3.2.2 The bowl shall have a flanged rim for rigidity.

3.2.3 The bowl may be ribbed internally.

3.2.4 The bowl and stem shall be ribbed externally with at least three evenly spaced ribs.

3.2.5 The end of the stem shall be finished at approximately 45° to the axis.

3.3 Dimensions — Dimensions of preferred sizes shall be as given in Table 1 read with Fig. 1.

TABLE 1 DIMENSIONS FOR FILTER FUNNELS

(*Clause* 2.1 *and* 3.3)

	DIMENSIONS IN mm					
Internal diameter of the top of bowl, D_1	35	55	75	100	150	200
Maximum external diameter of top of stem, D_2	9	11	13	17	22	30
Minimum internal diameter at bottom of stem, D_3	4	4	4	6	8	10

3.3.1 The inner wall of the bowl shall diverge from the axis so as to give an included angle of $60^{+0°}_{-3°}$.

3.3.2 The length of the stem shall be between 75 percent and 100 percent of the bowl diameter for sizes up to 100 mm and between 60 percent and 80 percent for sizes above 100 mm.

3.3.3 The wall thickness for both the bowl and stem of the plastic filter funnel should be of the order of 2 percent of the top internal diameter (D_1), subject to a minimum of 1 mm for the filter funnel having top internal diameter of less than 50 mm. The tolerance on the wall thickness shall be ±5 percent.

3.3.3.1 The wall thickness and rim designs shall be such that, when tested for flexibility in accordance with the procedure detailed in Appendix B, the diameter of the bowl at the point of loading shall not increase by more than 5 percent.

4. MARKING AND PACKING

4.1 Marking — Plastics filter funnels shall be engraved with the following:

a) Nominal size followed by letters 'mm', which shall refer to the internal cone diameter; and

b) The name of the manufacturer or his recognized trade-mark, if any.

4.1.1 The following information shall be provided either on each filter funnel packed in polyethylene or paper bag or on the label on the primary packing boxes:

a) The name of the material from which the filter funnel is made and the manufacturer's recommended safe maximum temperature for short term use (several hours) in contact with materials which do not attack the plastics materials, for example for polypropylene PP 130°C *Max.*

NOTE — The temperature in the example is merely intended to indicate an inscription and does not represent any particular grade of plastics material.

b) The words 'No Flame'.

4.1.2 The manufacturer shall also provide a catalogue giving details of physicochemical properties of the raw materials used for the manufacture of filter funnel and the detergent to be used for washing (*see* **A-1.6**).

4.1.3 Filter funnels may also be marked with the ISI Certification Mark.

NOTE — The use of the ISI Certification Mark is governed by the provisions of the Indian Standards Institution (Certification Marks) Act and the Rules and Regulations made thereunder. The ISI Mark on products covered by an Indian Standard conveys the assurance that they have been produced to comply with the requirements of that standard under a well-defined system of inspection, testing and quality control which is devised and supervised by ISI and operated by the producer. ISI marked products are also continuously checked by ISI for conformity to that standard as a further safeguard. Details of conditions under which a licence for the use of the ISI Certification Mark may be granted to manufacturers or processors, may be obtained from the Indian Standards Institution.

4.2 Packing — Each filter funnel shall be packed as per **4.1.1**. The number of individual filter funnels packed in a cardboard box shall be indicated on the label.

5. SAMPLING

5.1 Representative samples of funnels shall be drawn and adjudged as prescribed in IS : 4426-1967*.

APPENDIX A

(*Clause* 3.1.1)

TEST FOR IONIC MATERIAL EXTRACTED BY WATER AT 60°C

A-1. APPARATUS AND SOLUTIONS

A-1.1 Stoppers — made of borosilicate glass, sizes appropriate to the filter funnels under test.

A-1.2 Watch Glasses and Beakers — made of borosilicate glass, and of sizes appropriate to the filter funnels under test.

A-1.3 Oven — capable of being maintained at 60 ± 2°C.

A-1.4 Conductivity Meter — suitable for measurement of the electrical conductivity of water.

A-1.5 De-ionized Water — of which the conductivity shall be less than 200 μS/m.

A-1.6 Detergent Solution — as recommended by the manufacturer.

A-2. PROCEDURE

A-2.1 Thoroughly wash each filter funnel under test with hot water and detergent solution (*see* **A-1.6**), then rinse well with hot water (< 60°C) followed by cold water and finally with liberal quantities of de-ionized water till the conductivity of the final rinse is the same as of the original de-ionized water. Insert a clean borosilicate stopper into the stem of each funnel to seal an end and rinse the inside of each funnel again with liberal quantities of de-ionized water. Suspend each funnel in a suitable size beaker, fill each funnel to within 1 cm of its brim with the de-ionized water and cover with a clean watchglass. Stand each beaker in an oven at 60 ± 2°C for 5 h.

*Methods of sampling laboratory glassware and medical glass instruments.

A-2.2 Remove the funnel and support from the oven and allow the contents to cool to 27°C. Measure the electrical conductivity of the water in the funnel by the method prescribed in **9** of IS : 3025-1964* and deduct it from the value obtained the conductivity of the original water used to prepare the extract, also measured at 27°C. Note the difference in conductivity in μS/m.

APPENDIX B

(*Clause* 3.3.3.1)

TEST FOR FLEXIBILITY OF PLASTICS FILTER FUNNELS

B-1. APPARATUS

B-1.1 One kg Weight — attached by approximately 20 cm of strong thread to an S hook made by bending iron or steel wire (diameter 3 $\pm$ 1 cm) to a radius of curvature at the top bend of approximately 5 mm.

B-1.2 Soft Rubber Bung — to fit lower end of funnel stem.

B-1.3 Laboratory Stand and Clamps

B-2. PROCEDURE

B-2.1 Seal the lower end of the stem with the rubber bung. Assemble the stand and firmly clamp the funnel in a vertical position at a point approximately 1 mm below the junction of the stem and the cone. For funnels having a tapered stem some packing may be required at the clamping point and if necessary a second clamp may be placed at the lower end of the stem. Mark a point on the rim of the funnel cone and measure the external diameter of the cone at this point. Suspend the 1 kg weight to hang freely from the rim of the funnel at the marked point by means of the S hook. Fill the funnel to within 5 mm of the brim with water at 60 $\pm$ 2°C.

B-2.2 One minute after filling, and while still under stress, re-measure the diameter of the cone at the marked point. Ignore any drop in temperature of the water during this period. Calculate the percentage increase in diameter.

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*Methods of sampling and test (physical and chemical) for water used in industry.